



PATENT  
P57009

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

BYOUNG-CHUL KIM, *et al.*

Serial No.: 10/759,235

Examiner: *To be assigned*

Filed: 20 January 2004

Art Unit: 2153

For: DISTRIBUTED ROUTER FOR DYNAMICALLY MANAGING FORWARDING  
INFORMATION AND METHOD THEREOF

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O.Box 1450  
Alexandria, VA 22313-1450

Sir:

In accordance with 37 C.F.R. §1.56, and §§1.97 and 1.98 as amended, Applicant cites, describes, and provides copies of the following art references.

**U.S. PATENT REFERENCES:**

- U.S. Patent No. 6,078,963 to Civanlar, *et al.*, entitled *ROUTER WITH DE-CENTRALIZED PROCESSING USING INTELLIGENT PORTS*, issued on 20 June 2000.
- U.S. Patent No. 6,212,184 to Venkatachary, *et al.*, entitled *FAST SCALEABLE METHODS AND DEVICES FOR LAYER FOUR SWITCHING*, issued on 3 April 2001.

**FOREIGN PATENT REFERENCES:**

- European Patent Publication No. EP 1 063 827 to Goudreau, entitled *METHOD FOR ADDRESS LOOKUP*, published on 27 December 2000 (with English abstract).

- European Patent Publication No. EP 0 969 630 to Tsukakoshi, *et al.*, entitled *METHOD FOR SHARING NETWORK INFORMATION AND ROUTER APPARATUS*, published on 5 January 2000 (with English abstract).

#### **OTHER DOCUMENTS:**

- European Search Report corresponding to European Patent Application No. 04002060.4-1249, issued on 6 June 2007.

#### **DISCUSSION**

According to the European Search Report issued on 6 June 2007, corresponding to European Patent Application No. 04002060.4-1249, **Civanlar, *et al.*, US'963** discloses that an improved network router having a plurality of intelligent router ports. Each intelligent router port may have its own routing and/or forwarding engines. Thus, a centralized master routing and forwarding engine, existing in conventional routers, is not necessary. Accordingly, the bottlenecking problems associated with a centralized routing and forwarding engine are significantly reduced.

**Venkatachary, *et al.*, US'184** relates that fast, scalable methods and devices are provided for layer four switching in a router as might be found in the Internet. In a first method, a grid of tries, which are binary branching trees, is constructed from the set of routing filters. The grid includes a dest-trie and a number of source tries. To avoid memory blowup, each filter is stored in exactly one trie. The tries are traversed to find the lowest cost routing. Switch pointers are used to improve the search cost. In an extension of this method, hash tables may be constructed that point to grid-of-tries structures. The hash tables may be used to handle combinations of port fields and protocol fields. Another method is based on hashing, in which searches for lowest cost matching filters take place in bit length tuple space. Rectangle searching with precomputation and markers are used to eliminate a whole column of tuple space when a match occurs, and to eliminate the rest of a row when no match is found. Various optimizations of these methods are also provided. A router incorporating

memory and processors implementing these methods is capable of rapid, selective switching of data packets on various types of networks, and is particularly suited to switching on Internet Protocol networks.

**Goudreau, EP'827** relates that an efficient method of storing prefixes related to addresses in a binary trie fashion wherein no each node in the tree has a prefix stored in it and no node is empty. Methods for searching, inserting and deleting. A network system with prefixes of network addresses stored in a binary trie fashion wherein no each node in the tree has a prefix stored in it and no node is empty. Fast longest matching prefix lookup, efficient memory usage (one node per prefix), and fully dynamic operation are supported. A greedy algorithm that calculates the binary trie of the present invention with minimum overall depth. A dynamic programming approach that constructs the binary trie of the present invention with the minimal expected number of search steps, based on an arbitrary distribution of destination IP addresses. A pipelined hardware structure for the binary trie of the present invention, providing a throughput of one longest prefix match per memory access time, with insert and delete operations requiring no more than two clock cycle stalls in the pipeline.

**Tsakakoshi, et al., EP'630** relates that a highly-expandable router configuration technology which flexibly meets the need to increase lines as a network grows. A network information sharing unit (14) is provided in a route calculation unit (20) of each router (12) in a clustered router (11). The network information sharing unit (14) receives an update notification of network information collected by routing protocol units (15) and sends this update information to all other routers in the clustered router (11) as a network information notification packet (19). The network information sharing units (14) in the receiving router notifies the routing protocol units (15) of the contents of the received updated information. The routing protocol unit (15) updates the network information thereof based on the notified contents, thereby allowing the network information obtained from all


routers outside the clustered router (11) to be shared and the clustered router (11) to be recognized externally as a single router.

Pursuant to 37 CFR §1.97(d), the undersigned attorney hereby certifies that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign patent application not more than three (3) months prior to the filing of the statement.

The citation of the foregoing references is not intended to constitute an assertion that other or more relevant art does not exist. Accordingly, the Examiner is requested to make a wide-ranging and thorough search of the relevant art.

No fee is incurred by this Statement.

Respectfully submitted,



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# INFORMATION DISCLOSURE STATEMENT

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APPLICANT BYOUNG-CHUL KIM, *et al.*

FILING DATE 20 January 2004 GROUP 2153

## U.S. PATENT DOCUMENTS

EXAMINER	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
/K.H.S./	6,078,963	06/2000	Civanlar, <i>et al.</i>			
/K.H.S./	6,212,184	04/2001	Venkatachary, <i>et al.</i>			

## FOREIGN PATENT DOCUMENTS

## TRANSLATION

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	YES	NO
/K.H.S./	EP 1 063 827	12/2000	EUROPE			Abstract	
/K.H.S./	EP 0 969 630	01/2000	EUROPE			Abstract	

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

European Search Report corresponding to European Patent Application No. 04002060.4-1249,  
issued on 6 June 2007.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.H.S./

EXAMINER: /Kyung Hye Shin/

DATE CONSIDERED: 03/09/2008

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP §609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.